REMARKS

Applicants respectfully request reconsideration of the present application in view of the amendments set forth above and the below remarks.

Claims 1-30 are pending in the application. Claims 14, 20 and 30 are amended herein.

Applicants submit herewith a redlined copy of Figure 1 showing a proposed change by which Figure 1 is divided into Figures 1A and 1B in order to comply with Patent Office drawing requirements. Applicants also submit herewith a redlined version of new Figure 1 illustrating the relationship between Figures 1A and 1B. No new matter is added by the proposed drawing changes. Presupposing approval of the proposed drawing changes, replacement Figures 1, 1A and 1B are filed herewith.

Claims 1-30 have been rejected as being anticipated by U.S. Patent No. 5,680,580 to Beardsley et al. (hereinafter "Beardsley"). Applicants respectfully traverse this rejection. With regard to claim 1, it is submitted that Beardsley neither describes nor suggests "determining from a switch fabric ... information identifying ports of the switch fabric" or "using the configuration topology information and the information obtained from the switch fabric to establish a logical link between a port on the storage system and a port on a second storage system..." as set forth in claim 1. With regard to claim 15, it is submitted that Beardsley neither describes nor suggests "means for determining from a switch fabric that connects to ports of all of the data storage systems information identifying ports of the other data storage systems connected to the switch fabric" or "means for using the configuration topology information and the information obtained from the switch fabric to establish a logical link between a port on the storage system and a second port on a second storage system..." as set forth in claim 15.

The claimed arrangement provides increased connectivity as compared to conventional remote data mirroring arrangements utilizing a dedicated one-to-one protocol in which source and target device groups are connected by two dedicated links, since with the claimed arrangement,

links previously required for mirroring are available for other connections. Such increased connectivity provides for better performance (e.g., load balance) as well as increased redundancy (see specification at page 3, lines 21-30). The claimed arrangement also provides an efficient configuration scheme for the increased connectivity system, since configuration information is provided by the switch fabric, rather than requiring each port to be individually configured.

Regarding claims 1 and 15, the Examiner directs Applicant's attention to col. 4, line 60 to col. 5, line 34 and col. 9, lines 3-57. While at col. 5, line 4, establishing logical paths is mentioned, there is no suggestion of "determining from a switch fabric ... information identifying ports of the switch fabric" or "using the configuration topology information and the information obtained from the switch fabric to establish a logical link between a port on the storage system and a port on a second storage system..." as set forth in claims 1 and 15. And the col. 9 excerpt describes establishing a remote device for data shadowing, but again, does not suggest "determining from a switch fabric ... information identifying ports of the switch fabric" or "using the configuration topology information and the information obtained from the switch fabric to establish a logical link between a port on the storage system and a port on a second storage system..." as set forth in claim 1 and similarly in claim 15.

Regarding establishing logical paths, Beardsley teaches that "[T]he remote copy session begins at step 401 wherein the primary host 301 issues a perform subsystem function (PSF) order establishing a remote or secondary storage controller for the remote copy session. Step 401 involves the primary processor 301 defining paths to be used between the primary and secondary sites 360 and 370, respectively, and further includes primary storage controller 325 initializing the defined paths." (Col. 8. lines 26-33) Beardsley thus appears to describe that the identity of the destination controller is known and there is no description or suggestion that dynamic switch 305 or 315 provides information identifying ports of the other data storage systems connected to the switch, as claimed.

Claims 2-12 depend from and thus include the limitations of claim 1 and claims 16-26 depend from and thus include the limitations of claim 15. Accordingly, claims 2-12 and claims

16-26 are believed to be patentable at least for the reasons discussed above in conjunction with claims 1 and 15, respectively.

It is submitted that at least the below discussed dependent claims are further patentable over Beardsley for noted reasons. Claims 6 and 20 are believed to be further patentable over Beardsley since the reference neither describes nor suggests "receiving from the switch fabric a list of the ports of the other data storage systems, the list including for each of the ports a corresponding World Wide Name, the World Wide Name including unique names for processors and a serial number for the data storage system with which the port is associated." Nor does Beardsley contemplate "determining if any of the device groups are served by the World Wide Name" as set forth in claims 7 and 21. Beardsley also does not describe or suggest "determining if a serial number of one of the storage systems pointed to by any of the device groups matches the serial number included in the World Wide Name; if a match exists, reading the unique processor name that is associated with the pointer that points to the matched device group; and writing to a new link entry in a link table pointers to the unique processor name and the device group as well as a state value of one" as set forth in claims 8 and 22.

Claims 9 and 23 are also believed to be further patentable over Beardsley since the reference does not contemplate "performing a single link discovery for the port and the port having the World Wide Name." Nor does Beardsley describe or suggest the arrangement of claims 10 and 24 in which "the ports are state machines and the single link discovery establishes the logical link when each of the state machines advances to a '0xFF' state from a '1' state." Beardsley also does not describe or suggest "exchanging between the ports data from the respective configuration topology tables of the ports to determine if the data matches" as is set forth in claims 11 and 25.

With respect to independent claims 13 and 27, it is submitted that Beardsley neither describes nor suggests "for each device group and corresponding device group, first ports associated with the device group and second ports associated with the corresponding device group," as claimed. Claim 29 similarly requires "associating ports with a group of devices that are

supported in a mirrored configuration with a corresponding group of devices with which ports on one of the other data storage systems are associated." As is described on pages 13 and 14 in connection with FIG. 5 and illustrative controller 16b, "the controller 16b can use its two ports, port 34c and 34d to achieve the following logical links..." As is further described, "using the switch architecture and the two ports/processors per controller, a connection between two device groups, e.g., S_3 and T_3, can be achieved with one of four possible logical links..." The claimed arrangement enhances the connectivity of the system as is described in the Summary of the Invention section for example. Beardsley does not contemplate that a device group be associated with ports as claimed. In this regard, the Examiner again directs Applicant's attention to col. 4, line 60 to col. 5, line 34 and col. 9, lines 3-57. However, none of the cited excerpts describes or suggests "for each device group and corresponding device group, first ports associated with the device group and second ports associated with the corresponding device group" as set forth in claims 13 and 27 or "associating ports with a group of devices that are supported in a mirrored configuration with a corresponding group of devices with which ports on one of the other data storage systems are associated" as set forth in claim 29.

Independent Claim 14 has been amended to clarify that the port is adapted to control more than one device group and that the port uses the switch element to link the port to a selected one or more of the ports controlling second device groups that mirror the more than one device group controlled by the port. Claim 30 has been similarly amended to describe configuring a port to control more than one device group and linking the port to a selected one or more of the ports controlling second device groups that mirror the more than one device group controlled by the port. Support for the amendments to claims 14 and 30 can be found on page 14, lines 1-6 for example. It is submitted that Beardsley neither describes nor suggests the claimed arrangement in which a port is adapted to control more than one device group, as claimed.

With regard to independent claim 28, it is submitted that Beardsley neither describes nor suggests the claimed "port adapted to control at least one device group; the port being further adapted to connect to ports in the other data storage systems via a switch... ." In this regard, the Examiner directs Applicant's attention to Figure 2, refs. 205, 215, Figure 3, refs. 305, 315, and

Figure 9, ref. 905. However, none of these figures shows a port adapted to connect to ports in the other data storage systems, as claimed. For example, regarding Figure 3, it is described at column 8, lines 14-23 that "primary storage controller 322, via port A 321, can communicate with primary host 301 by communication links 350, dynamic switch 305... . Alternately, primary storage controller 322, via the same port A 321, can communicate with secondary storage controller 332 by communication lnks 350, dynamic switch 305... ."

In view of the above, it is submitted that claims 1-30 are patentable over Beardsley.

It is respectfully submitted that the claims and the entire case are in condition for allowance. Accordingly, an early indication of allowance is respectfully requested.

The Examiner is respectfully invited to telephone the undersigning attorney if there are any questions regarding this Amendment or this application.

Applicants do not acquiesce to any assertion made by the Examiner that is not specifically addressed herein.

The Assistant Commissioner is hereby authorized to charge payment of any additional fees associated with this communication or credit any overpayment to Deposit Account No. 500845.

Respectfully submitted,

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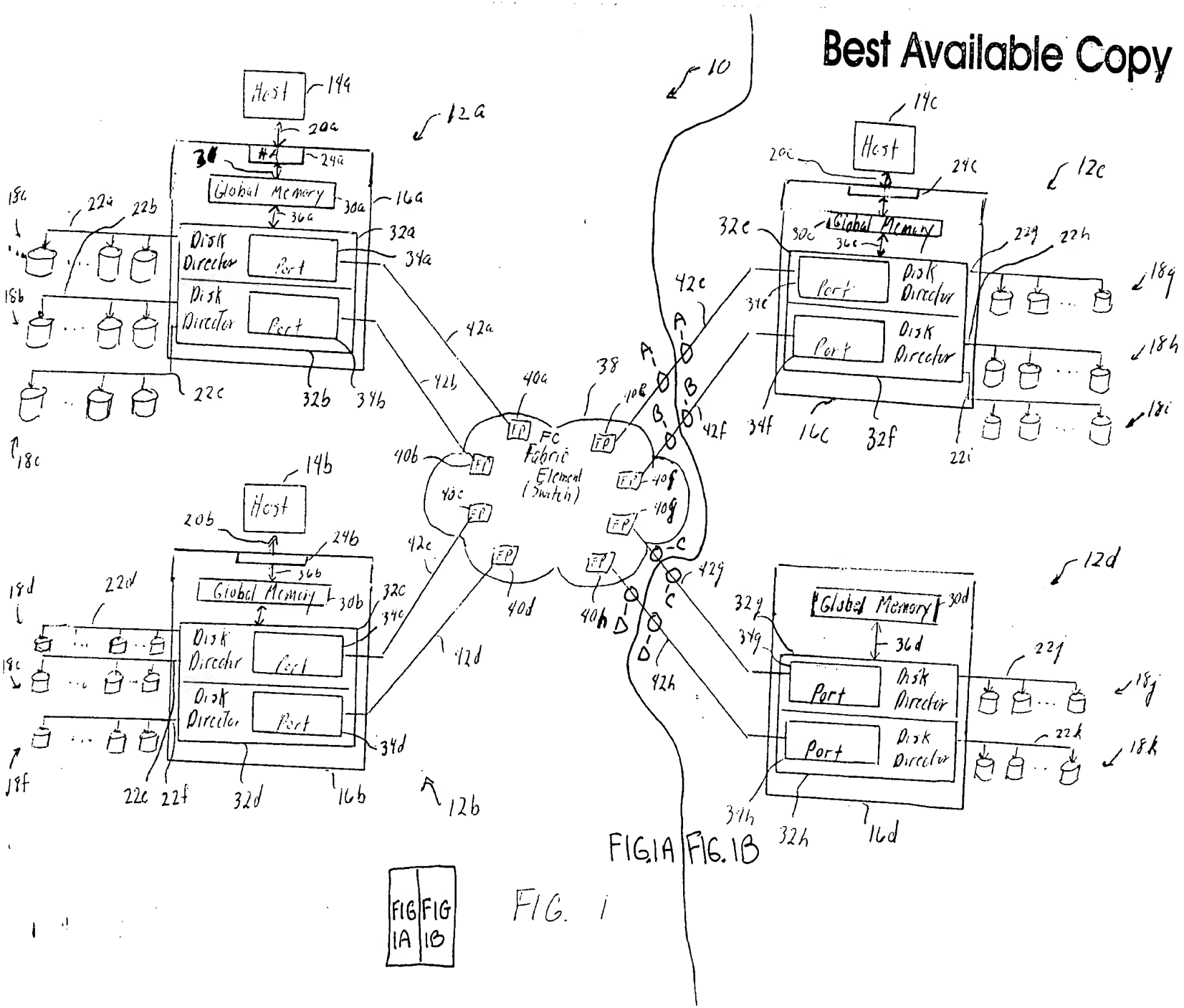

FIG. 1

FIG 1A | FIG 1B